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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,009	02/20/2002	Mitsuru Uesugi	L9289.02118	4532

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EXAMINER

AGHDAM, FRESHTEH N

ART UNIT	PAPER NUMBER
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2631

DATE MAILED: 05/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/069,009

Applicant(s)

UESUGI ET AL.

Examiner

Freshteh N. Aghdam

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-12 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2/20/02
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 3, 11, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Sugiyama et al (US 5,862,175).

As to claim 1, Sugiyama et al teach a digital transmission apparatus, wherein the transmitting side apparatus sets different error detecting units corresponding to bit positions (Fig. 1; FEC Encoders 3-1 to 3-n) and transmits data subjected to the error detecting units; the receiving side apparatus performs demodulation independently for each error detecting units using different demodulation patterns to obtain received data (Fig. 3; Col.3, Lines 1-13).

As to claim 11, Sugiyama et al teach a digital transmission apparatus, wherein the transmitting side apparatus sets different error detecting units corresponding to bit positions (Fig. 1; FEC Encoders 3-1 to 3-n) and transmits data subjected to the error detecting units.

As to claim 12, Sugiyama et al teach a digital transmission apparatus, wherein the transmitting side apparatus sets different error detecting units corresponding to bit positions (Fig. 1; FEC Encoders 3-1 to 3-n) and transmits data subjected to the error

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detecting units; the receiving side apparatus performs demodulation independently for each error detecting units using different demodulation patterns to obtain received data (Fig. 3; Col.3, Lines 1-13).

As to claim 2, Sugiyama et al teach a modulation communication system wherein the modulation scheme is varied among M-ary modulation schemes (n phase shift keying modulation schemes) each with a square root of the number of signal points being an integer (Fig. 1, 2^n multi-level modulation means; Col. 3, Lines 5-9).

As to claim 3, Sugiyama et al teach a modulation communication system wherein the modulation scheme is varied among M-ary modulation schemes (n phase shift keying modulation schemes) each with a square root of the number of signal points not being an integer (Fig. 1, 2^n multi-level modulation means; Col. 3, Lines 5-9).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama et al, and further in view of the admitted prior art.

As to claim 9, Sugiyama et al teach all the claimed above, except for performing a repeat request for each error detecting unit. The admitted prior art teaches obtaining

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the repeat request signal outputted from the error-detecting unit 16 (Fig. 1). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of the admitted prior art with Sugiyama et al in order to achieve an adaptive modulation communication system with increased transmit amounts (Pg. 1, Lines 14 and 15).

As to claim 10, Sugiyama et al teach all the subject matters claimed above except for the modulation scheme is varied based on channel quality estimated from the repeat request signal. The admitted prior art teaches receiving data by CQES (i.e. Channel Quality Estimation Section; Fig. 1, Block 1) wherein the received data contains the repeat request signal and based on the result of the channel quality estimation section, modulation level is estimated at block 2 (i.e. MLDS or modulation level detection section). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of the admitted prior art with Sugiyama et al in order to obtain an improved fast downlink transmission.

Claims 4, 5, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama et al, and further in view of lee et al (US 6,259,744).

As to claim 4, Sugiyama et al teach all the claimed subject matters claimed above, except for the arrangement of signal points in such a way that a difference between the number of signal points on the I-axis and Q-axis is small. Lee et al, in the same field of endeavor, teach a signal space diagram wherein the number of signal points on the I-axis is the same as the number of signal points on the Q-axis (Fig. 3). Therefore, it would have been obvious to one of ordinary skill in the art to combine the

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teaching of Lee et al with Sugiyama et al in order to minimize header decoded BER (i.e. bit error rate) over many channel conditions (Col. 2, Lines 17-19).

As to claims 5 and 6, Sugiyama et al teach all the subject matters as recited in claim 1, except for the modulation scheme is varied adaptively among M-ary modulation schemes each using phase determination axes passing through the origin point in the signal space diagram are modulation schemes in which identification in an amplitude direction is performed. Lee et al, in the same field of endeavor, teach using phase determination axes (Fig. 3, means 54 and 56; Col. 5, Lines 1-12 and 51-53) passing through the origin point in a signal space diagram and computing the closest distance between the symbol and the bit on the decision line (i.e. amplitude identification). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Lee et al with Sugiyama et al in order to detect error probability of a bit in a symbol (Col. 5, Lines 7 and 8).

As to claim 7, Sugiyama et al and Lee et al teach all the subject matters claimed above, except for performing error correction coding every a plurality of bits. One of ordinary skill in the art would clearly recognize that error correcting could be performed on a bit or a byte basis.

Allowable Subject Matter

Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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As to claim 8, prior art of record fails to teach a method for setting the position of pilot signals using a value half the maximum amplitude in a signal space diagram of an M-ary modulation scheme having the largest modulation level.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Mantel et al (US 5,602,875), Satio et al (US 5,872,812), Iemura (US 6,310,513), Mc Nicol et al (US 5,036,526), Calderbank (US 5,377,194), Ichimura et al (US 5,920,577).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Freshteh N. Aghdam whose telephone number is (571) 272-6037. The examiner can normally be reached on Monday through Friday 9:00-5:30 pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Freshteh Aghdam

April 28, 2005



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